

Index Number:

Sri Lanka Institute of Information Technology



B.Sc. Eng. (Honours) Degree
in
Electrical and Electronic Engineering

Final Examination
Year 2, Semester I (2016)

EC2491 – Object Oriented Programming

Paper Version A

Duration: 2 Hours

May, 2016

Instructions to Candidates:

- Answer ALL questions.
- There are 21 questions in total.
- 19 are MCQ questions that carry 4 marks each for a total of 76 marks.
- 2 Questions require that you provide written answers. These carry different marks. The Total marks for this paper is 100.
- This paper contains 15 pages including the Cover Page. No additional data is attached.
- Write your answers on this paper itself.

Unless otherwise indicated, each question carries 4 marks.

1.

```
class Pr{
    public static void main(String []s){
        System.out.println(s[0] + s[1] + s[2]);
    }
}
```

For the command line : java Pr A B C D E F

The above code prints:

- A) ABC
- B) BCD
- C) CDE
- D) A B C

2.

```
class A{
    public static void main(String args[]){
        //boolean b1=false;
        //boolean b2=FALSE;
        //boolean b3='false';
        //boolean b4 = 1;
    }
}
```

which of the above lines of code will NOT generate a compile error, when un-commented.

- A) boolean b1=false;
- B) boolean b2=FALSE;
- C) boolean b3='false';
- D) boolean b4 = 1;

3.

```
class A{
    private static int x=2;
    static void m(int i) { x++; i++; }

    public static void main(String args[]){
        int y=3;
        m(y);
        System.out.println(x+" "+y);
    }
}
```

The above code prints:

- A) 2,3
- B) 3,3
- C) 2,4
- D) 3,4

4.

```

class D{
    static int m1(int i){
        return i; //1
    }
    static void m2(int i){
        return i; //2
    }
    static int m3(int i){
        return; //3
    }
    public static void main(String args[]){
        System.out.print(""+m1(1)+m2(2)+m3(3)); //4
    }
}

```

The above code:

- A) prints : 123
- B) prints : 6
- C) generates compiler errors at //1 //2 //3
- D) generates compiler errors at //2 //3 //4

5.

```

class A{
    public static void main(String args[]){
        for(int i=0; i<5;i++){
            switch(i){
                case 0: System.out.println("p "); break;
                case 1: System.out.println("q ");
                case 2: System.out.println("r "); break;
                case 3: System.out.println("s ");
                case 4: System.out.println("t "); break;
                default: System.out.println("u ");
            }
        }
    }
}

```

The above code prints:

- A) p q r s t
- B) p q r s t u
- C) p q r r s t t
- D) p q q r s s t u

6.

```
class A{
    public static void main(String args[]){
        char a='a'; //'a'=97
        char b='b'; //'b'=98
        System.out.println(a+b+""+a+b);
    }
}
```

The above code prints:

- A) prints : 195195
- B) prints : 195ab
- C) prints : ab195
- D) prints : abab

7.

```
class A{
    void m1(A a) { System.out.print("A");}
}
class B extends A {
    void m1(B b) { System.out.print("B");}
}
class C extends A {
    void m1(C c) { System.out.print("C");}
}
class D{
    public static void main(String args[]){
        A a1=new A();
        B b1=new B();
        C c1=new C();
        A c2=new C();

        c2.m1(a1);
        c2.m1(b1);
        c2.m1(c1);
    }
}
```

The above code prints:

- A) AAA
- B) BBB
- C) CCC
- D) generates compile error(s).

8.

```
class A{
    int x=4;
    int y=3;

    public static void main(String args[]){
        System.out.println(x + y );
    }
}
```

The above code prints:

- A) 4 3
- B) 43
- C) 7
- D) generates compile error(s).

9.

```
class A{}
class B extends A{}
class C extends B{
    static void m(A x, A y){
        System.out.println("AA");
    }
    static void m(A x, B y){
        System.out.println("AB");
    }
    static void m(B x, A y){
        System.out.println("BA");
    }
    static void m(B x, B y){
        System.out.println("BB");
    }
    public static void main(String args[]){
        C c= new C();
        m(c,c);
    }
}
```

The above code :

- 1) Prints AA
- 2) Prints AB
- 3) Prints BA
- 4) Prints BB
- 5) compile error.

10.

```
class P{
    private String name;
    public String name(){
        return(name);
    }
    public P(String s){
        name =s;
    }
}

class Q{
    public static void m1(P i){
        i=null;
    }
    public static void main(String args[]){
        P i = new P("X");           //1
        m1(i);                       //2
        System.out.println(i.name()); //3
    }
}
```

Find the correct statement relating to the above code:

- A) The Object created in line //1 is eligible for garbage collection in line //2
- B) A NullPointerException is generated in line //3.
- C) Prints X
- D) Compile Error.

11.

```
public class Basics {}           //1
class Basics1 {}                 //2
protected class Basics2 {},     //3
private class Basics3 {}        //4
```

The above code produces:

- A) Compile Error in lin1 //1 and //2
- B) Compile Error in lin1 //2 and //3
- C) Compile Error in lin1 //3 and //4
- D) non of the above

12.

```
class A{
    A(){}          //1
    int A;         //2
    void A(){}     //3
    class A{}      //4
}
```

Which of the following lines generate compiler errors.

A) //1

B) //2

C) //3

D) //4

13.

```
class B{
    static int m1(byte b){
        return b; //1
    }
    static int m2(char c){
        return c; //2
    }
    static int m3(short s){
        return s; //3
    }
    static int m4(long l){
        return l; //4
    }
    static int m5(float f){
        return f; //5
    }
    public static void main(String args[]){
        byte b=1;
        char c='c'-'a';
        short s=3;
        long l=4L;
        float f=5.0f;
        System.out.println(""+m1(b)+m2(c)+m3(s)+m4(l)+m5(f));
    }
}
```

The above code prints:

A) 12345

B) 12345.0

C) compile error at //3 and //4

D) compile error at //4 and //5

14.

```
class K{
    public static void main(String args[]){
        System.out.print(Math.round(-3.6)+",");
        System.out.print(Math.round(-3.4)+",");
        System.out.print(Math.round(3.4)+",");
        System.out.print(Math.round(3.6));
    }
}
```

What is the result of compiling and running this program.

- A) -3.0,-4.0,3.0,4.0
- B) -3.0,-4.0,4.0,3.0
- C) -4.0,-3.0,3.0,4.0
- D) -4.0,-4.0,3.0,3.0

15.

```
class A{                                     //1
    int x=1;                                //2
    public static void main(String args[]){ //3
        int y=2;                            //4
        System.out.print("x="+x);          //5
        System.out.print(", y="+y);       //6
    }
}
```

This code produces:

- A) x=1, y=2
- B) Compilation Error in line //5
- C) Compilation Error in line //6
- D) Runtime Error

16.

```
class A{
    void m1(A a) {System.out.print("A");}
}
class B extends A{
    void m1(B b) {System.out.print("B");}
}
class C extends B{
    void m1(C c) {System.out.print("C");}
}
class D{
    public static void main(String args[]){
        A c1 = new C();
        B c2 = new C();
        C c3 = new C();
        C c4 = new C();
        c4.m1(c1);
        c4.m1(c2);
        c4.m1(c3);
        System.out.println("");
    }
}
```

The above code:

- A) prints : AAA
- B) prints : BBB
- C) prints : CCC
- D) prints : ABC
- E) Compile error

17.

```
class J{
    public static void main(String args[]){
        StringBuffer s1 = new StringBuffer(32);
        System.out.print(s1.length() + "," + s1.capacity());
    }
}
```

The above code:

- A) Prints: 0,0
- B) Prints: 0,32
- C) Prints: 32,0
- D) Prints: 32,32
- E) Compile Error

18.

```
class E{
    E(){
        System.out.print("E");
    }
    static class Z{
        Z(){
            System.out.print("Z");
        }
    }
    public static void main(String args[]){
        new E.Z();
        System.out.println("");
    }
}
```

The above code:

- A) prints : E
- B) prints : Z
- C) prints : EZ
- D) prints : ZE
- E) compile error

19.

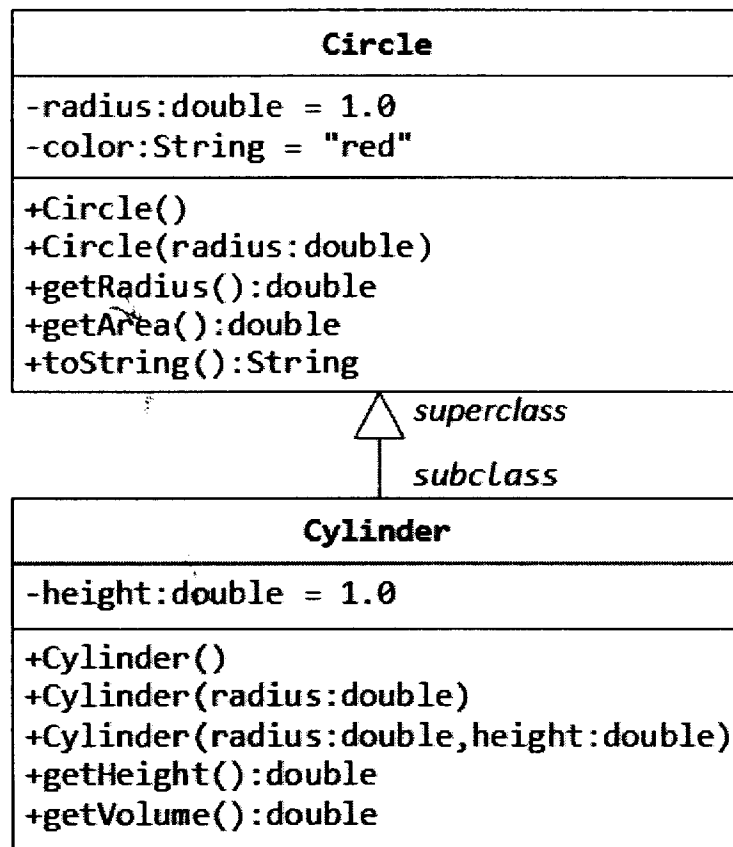
```
class Q{
    static int m(int i){
        System.out.print(i+", ");
        return i;
    }
    public static void main(String args[]){
        int i = 1;
        m(++i);           //line A
        m(i++);           //line B
        m(-i);            //line C
        m(i++);           //line D
    }
}
```

The above code prints:

- A) 1,2,-3,4
- B) 2,2,-3,3
- C) 2,2,3,3
- D) 1,2,3,4

20.

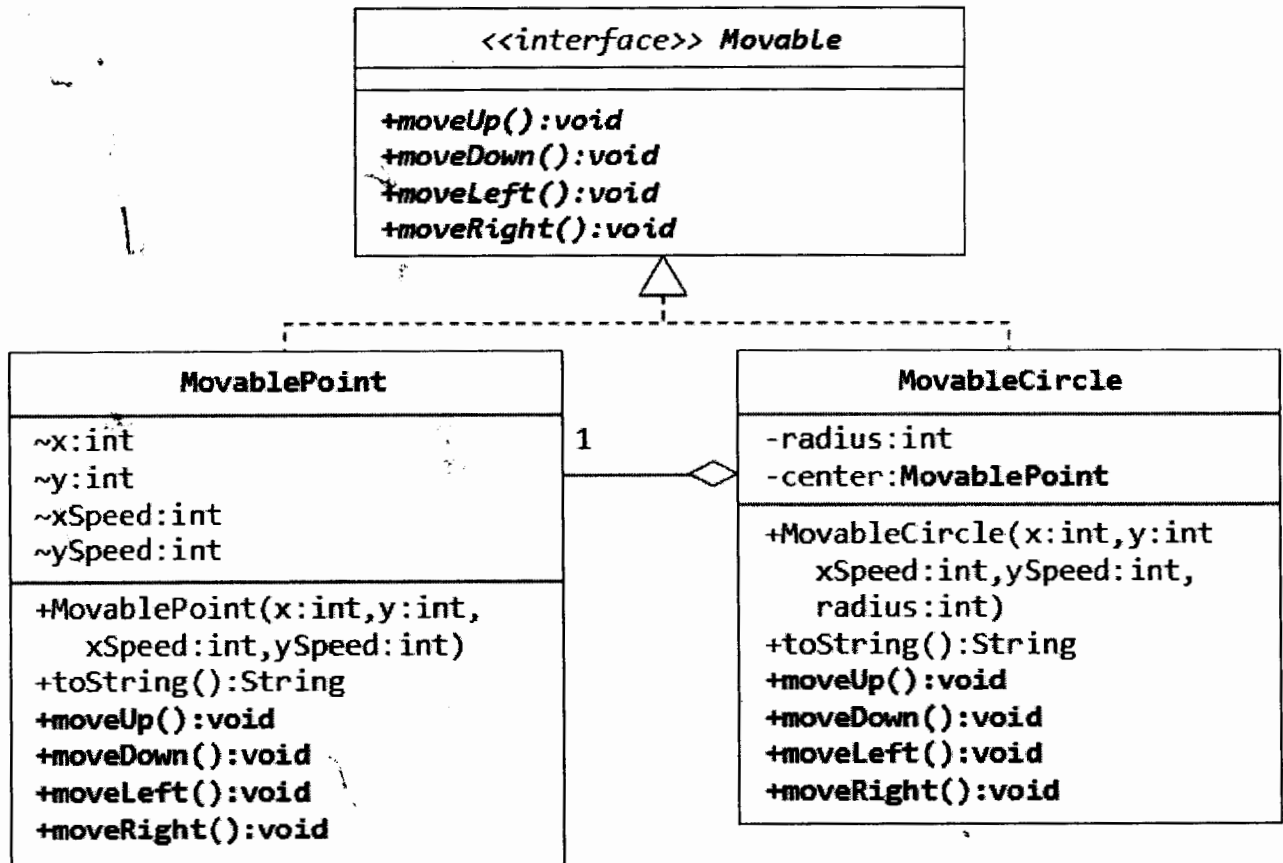
Write the **complete** java code for the following class Diagram. (space is provided, but you may use the rough sheet paper provided if you need) **(10 Marks)**



Answer for Question 20:

21.

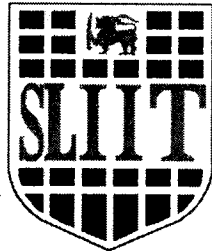
Write the interface definition and the Class declarations for the following UML diagram. You do not need to write the internals of the methods. But you do need to correctly define the method body in the class the method needs to have a body. Write your answer in the space provided. Marks will be deducted if you write unneeded code. **(14 Marks)**



Answer for Question 21:

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Paper Version B

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- This paper contains 15 pages including the Cover Page. No additional data is attached.
- Write your answers on this paper itself.

Unless otherwise indicated, each question carries **4 marks**.

1.

```
class A{
    private static int x=2;
    static void m(int i) { x++; i++; }

    public static void main(String args[]){
        int y=3;
        m(y);
        System.out.println(x+", "+y);
    }
}
```

The above code prints:

A) 2,3

B) 3,3

C) 2,4

D) 3,4

2.

```
class D{
    static int m1(int i){
        return i; //1
    }
    static void m2(int i){
        return i; //2
    }
    static int m3(int i){
        return; //3
    }
    public static void main(String args[]){
        System.out.print(""+m1(1)+m2(2)+m3(3)); //4
    }
}
```

The above code:

A) prints : 123

B) prints : 6

C) generates compiler errors at //1 //2 //3

D) generates compiler errors at //2 //3 //4

3.

```
class Pr{
    public static void main(String []s){
        System.out.println(s[0] + s[1] + s[2]);
    }
}
```

For the command line : java Pr A B C D E F

The above code prints:

- A) ABC
- B) BCD
- C) CDE
- D) A B C

4.

```
class A{
    public static void main(String args[]){
        //boolean b1=false;
        //boolean b2=FALSE;
        //boolean b3='false';
        //boolean b4 = 1;
    }
}
```

which of the above lines of code will NOT generate a compile error, when un-commented.

- A) boolean b1=false;
- B) boolean b2=FALSE;
- C) boolean b3='false';
- D) boolean b4 = 1;

5.

```
class A{
    public static void main(String args[]){
        char a='a'; //'a'=97
        char b='b'; //'b'=98
        System.out.println(a+b+" "+a+b);
    }
}
```

The above code prints:

- A) prints : 195195
- B) prints : 195ab
- C) prints : ab195
- D) prints : abab

6.

```
class A{
    public static void main(String args[]){
        for(int i=0; i<5;i++){
            switch(i){
                case 0: System.out.println("p "); break;
                case 1: System.out.println("q ");
                case 2: System.out.println("r "); break;
                case 3: System.out.println("s ");
                case 4: System.out.println("t "); break;
                default: System.out.println("u ");
            }
        }
    }
}
```

The above code prints:

- A) p q r s t
- B) p q r s t u
- C) p q r r s t t
- D) p q q r s s t u

7.

```
class A{
    int x=4;
    int y=3;

    public static void main(String args[]){
        System.out.println(x + y );
    }
}
```

The above code prints:

- A) 4 3
- B) 43
- C) 7
- D) generates compile error(s).

8.

```
class A{
    void m1(A a) { System.out.print("A");}
}
class B extends A {
    void m1(B b) { System.out.print("B");}
}
class C extends A {
    void m1(C c) { System.out.print("C");}
}
class D{
    public static void main(String args[]){
        A a1=new A();
        B b1=new B();
        C c1=new C();
        A c2=new C();

        c2.m1(a1);
        c2.m1(b1);
        c2.m1(c1);
    }
}
```

The above code prints:

- A) AAA
- B) BBB
- C) CCC
- D) generates compile error(s).

9.

```
public class Basics {} //1
class Basics1 {} //2
protected class Basics2 {} //3
private class Basics3 {} //4
```

The above code produces:

- A) Compile Error in lin1 //1 and //2
- B) Compile Error in lin1 //2 and //3
- C) Compile Error in lin1 //3 and //4
- D) non of the above

10.

```
class A{}
class B extends A{}
class C extends B{
    static void m(A x, A y){
        System.out.println("AA");
    }
    static void m(A x, B y){
        System.out.println("AB");
    }
    static void m(B x, A y){
        System.out.println("BA");
    }
    static void m(B x, B y){
        System.out.println("BB");
    }
    public static void main(String args[]){
        C c= new C();
        m(c,c);
    }
}
```

The above code :

- 1) Prints AA
- 2) Prints AB
- 3) Prints BA
- 4) Prints BB
- 5) compile error.

11.

```
class K{
    public static void main(String args[]){
        System.out.print(Math.round(-3.6)+",");
        System.out.print(Math.round(-3.4)+",");
        System.out.print(Math.round(3.4)+",");
        System.out.print(Math.round(3.6));
    }
}
```

What is the result of compiling and running this program.

- A) -3.0,-4.0,3.0,4.0
- B) -3.0,-4.0,4.0,3.0
- C) -4.0,-3.0,3.0,4.0
- D) -4.0,-4.0,3.0,3.0

12.

```
class P{
    private String name;
    public String name(){
        return(name);
    }
    public P(String s){
        name =s;
    }
}

class Q{
    public static void m1(P i){
        i=null;
    }
    public static void main(String args[]){
        P i = new P("X");           //1
        m1(i);                       //2
        System.out.println(i.name()); //3
    }
}
```

Find the correct statement relating to the above code:

- A) The Object created in line //1 is eligible for garbage collection in line //2
- B) A NullPointerException is generated in line //3.
- C) Prints X
- D) Compile Error.

13.

```
class A{
    A(){}           //1
    int A;          //2
    void A(){}      //3
    class A{}       //4
}
```

Which of the following lines generate compiler errors.

- A) //1
- B) //2
- C) //3
- D) //4

14.

```
class B{
    static int m1(byte b){
        return b; //1
    }
    static int m2(char c){
        return c; //2
    }
    static int m3(short s){
        return s; //3
    }
    static int m4(long l){
        return l; //4
    }
    static int m5(float f){
        return f; //5
    }
    public static void main(String args[]){
        byte b=1;
        char c='c'-'a';
        short s=3;
        long l=4L;
        float f=5.0f;
        System.out.println(""+m1(b)+m2(c)+m3(s)+m4(l)+m5(f));
    }
}
```

The above code prints:

- A) 12345
- B) 12345.0
- C) compile error at //3 and //4
- D) compile error at //4 and //5

15.

```
Class A{
    int x=1;
    public static void main(String args[]){
        int y=2;
        System.out.print("x="+x);
        System.out.print(", y="+y);
    }
}
```

This code produces:

- A) x=1, y=2
- B) Compilation Error in line //5
- C) Compilation Error in line //6
- D) Runtime Error

16.

```
class E{
    E(){
        System.out.print("E");
    }
    static class Z{
        Z(){
            System.out.print("Z");
        }
    }
    public static void main(String args[]){
        new E.Z();
        System.out.println("");
    }
}
```

The above code:

- A) prints : E
- B) prints : Z
- C) prints : EZ
- D) prints : ZE
- E) compile error

17.

```
class Q{
    static int m(int i){
        System.out.print(i+", ");
        return i;
    }
    public static void main(String args[]){
        int i = 1;
        m(++i);           //line A
        m(i++);           //line B
        m(-i);            //line C
        m(i++);           //line D
    }
}
```

The above code prints:

- A) 1,2,-3,4
- B) 2,2,-3,3
- C) 2,2,3,3
- D) 1,2,3,4

18.

```
class A{
    void m1(A a) {System.out.print("A");}
}
class B extends A{
    void m1(B b) {System.out.print("B");}
}
class C extends B{
    void m1(C c) {System.out.print("C");}
}
class D{
    public static void main(String args[]){
        A c1 = new C();
        B c2 = new C();
        C c3 = new C();
        C c4 = new C();
        c4.m1(c1);
        c4.m1(c2);
        c4.m1(c3);
        System.out.println("");
    }
}
```

The above code:

- A) prints : AAA
- B) prints : BBB
- C) prints : CCC
- D) prints : ABC
- E) Compile error

19.

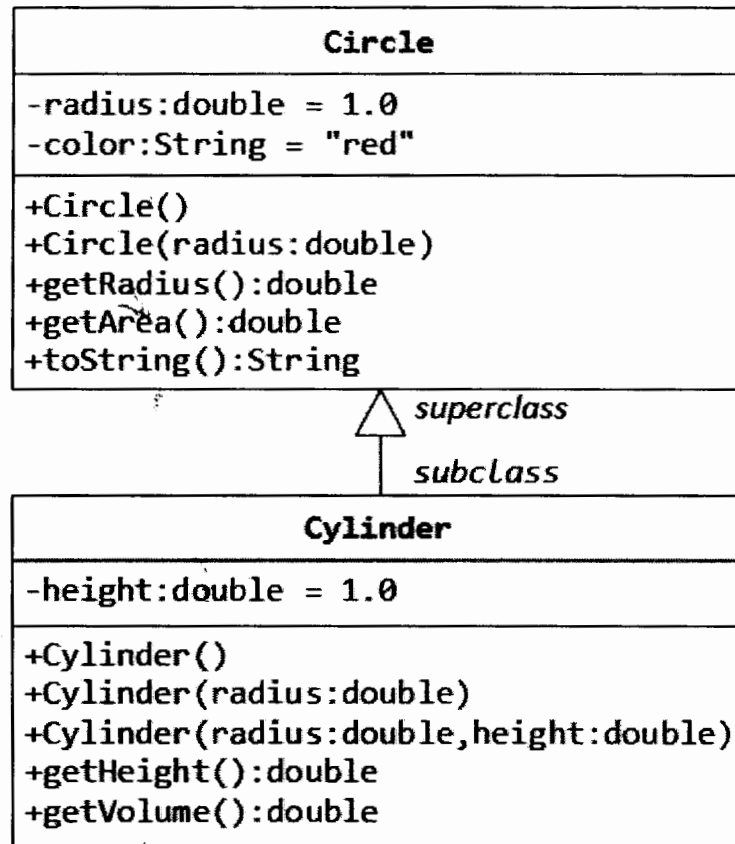
```
class J{
    public static void main(String args[]){
        StringBuffer s1 = new StringBuffer(32);
        System.out.print(s1.length() + "," + s1.capacity());
    }
}
```

The above code:

- A) Prints: 0,0
- B) Prints: 0,32
- C) Prints: 32,0
- D) Prints: 32,32
- E) Compile Error

20.

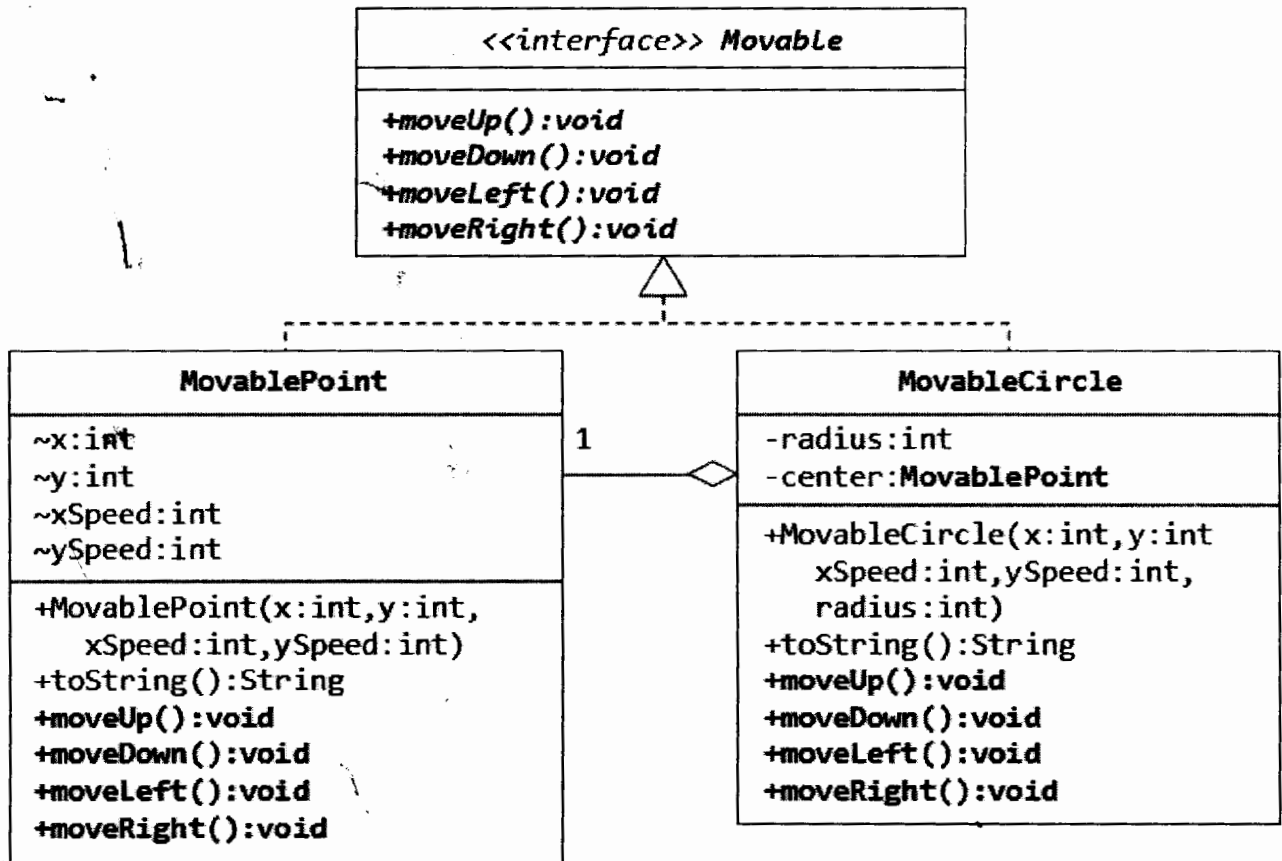
Write the **complete** java code for the following class Diagram. (space is provided, but you may use the rough sheet paper provided if you need) **(10 Marks)**



Answer for Question 20:

21.

Write the interface definition and the Class declarations for the following UML diagram. You do not need to write the internals of the methods. But you do need to correctly define the method body in the class the method needs to have a body. Write your answer in the space provided. Marks will be deducted if you write unneeded code. (14 Marks)



Answer for Question 21:

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Paper Version C

Duration: 2 Hours

May 2016

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Unless otherwise indicated, each question carries **4 marks**.

1.

```
class A{
    public static void main(String args[]){
        char a='a'; //'a'=97
        char b='b'; //'b'=98
        System.out.println(a+b+""+a+b);
    }
}
```

The above code prints:

A) prints : 195195

B) prints : 195ab

C) prints : ab195

D) prints : abab

2.

```
class A{
    private static int x=2;
    static void m(int i){ x++; i++; }

    public static void main(String args[]){
        int y=3;
        m(y);
        System.out.println(x+", "+y);
    }
}
```

The above code prints:

A) 2,3

B) 3,3

C) 2,4

D) 3,4

3.

```
class A{
    int x=4;
    int y=3;

    public static void main(String args[]){
        System.out.println(x + y );
    }
}
```

The above code prints:

A) 4 3

B) 43

C) 7

D) generates compile error(s).

4.

```
class D{
    static int m1(int i){
        return i; //1
    }
    static void m2(int i){
        return i; //2
    }
    static int m3(int i){
        return; //3
    }
    public static void main(String args[]){
        System.out.print(""+m1(1)+m2(2)+m3(3)); //4
    }
}
```

The above code:

- A) prints : 123
- B) prints : 6
- C) generates compiler errors at //1 //2 //3
- D) generates compiler errors at //2 //3 //4

5.

```
class Pr{
    public static void main(String []s){
        System.out.println(s[0] + s[1] + s[2]);
    }
}
```

For the command line : java Pr A B C D E F

The above code prints:

- A) ABC
- B) BCD
- C) CDE
- D) ABC

6.

```
class A{
    A() {} //1
    int A; //2
    void A() {} //3
    class A {} //4
}
```

Which of the following lines generate compiler errors.

- A) //1
- B) //2
- C) //3
- D) //4

7.

```
class A{
    public static void main(String args[]){
        //boolean b1=false;
        //boolean b2=FALSE;
        //boolean b3='false';
        //boolean b4 = 1;
    }
}
```

which of the above lines of code will NOT generate a compile error, when un-commented.

- A) boolean b1=false;
- B) boolean b2=FALSE;
- C) boolean b3='false';
- D) boolean b4 = 1;

8.

```
class A{
    public static void main(String args[]){
        for(int i=0; i<5;i++){
            switch(i){
                case 0: System.out.println("p "); break;
                case 1: System.out.println("q ");
                case 2: System.out.println("r "); break;
                case 3: System.out.println("s ");
                case 4: System.out.println("t "); break;
                default: System.out.println("u ");
            }
        }
    }
}
```

The above code prints:

- A) p q r s t
- B) p q r s t u
- C) p q r r s t t
- D) p q q r s s t u

9.

```
class A{
    void m1(A a) { System.out.print("A"); }
}
class B extends A {
    void m1(B b) { System.out.print("B"); }
}
class C extends A {
    void m1(C c) { System.out.print("C"); }
}
class D{
    public static void main(String args[]){
        A a1=new A();
        B b1=new B();
        C c1=new C();
        A c2=new C();

        c2.m1(a1);
        c2.m1(b1);
        c2.m1(c1);
    }
}
```

The above code prints:

- A) AAA
- B) BBB
- C) CCC
- D) generates compile error(s).

10.

```
public class Basics {} //1
class Basics1 {} //2
protected class Basics2 {} //3
private class Basics3 {} //4
```

The above code produces:

- A) Compile Error in lin1 //1 and //2
- B) Compile Error in lin1 //2 and //3
- C) Compile Error in lin1 //3 and //4
- D) non of the above

11.

```
class A{}
class B extends A{}
class C extends B{
    static void m(A x, A y){
        System.out.println("AA");
    }
    static void m(A x, B y){
        System.out.println("AB");
    }
    static void m(B x, A y){
        System.out.println("BA");
    }
    static void m(B x, B y){
        System.out.println("BB");
    }
    public static void main(String args[]){
        C c= new C();
        m(c,c);
    }
}
```

The above code :

- 1) Prints AA
- 2) Prints AB
- 3) Prints BA
- 4) Prints BB
- 5) compile error.

12.

```
class K{
    public static void main(String args[]){
        System.out.print(Math.round(-3.6)+",");
        System.out.print(Math.round(-3.4)+",");
        System.out.print(Math.round(3.4)+",");
        System.out.print(Math.round(3.6));
    }
}
```

What is the result of compiling and running this program.

- A) -3.0,-4.0,3.0,4.0
- B) -3.0,-4.0,4.0,3.0
- C) -4.0,-3.0,3.0,4.0
- D) -4.0,-4.0,3.0,3.0

13.

```
class P{
    private String name;
    public String name(){
        return(name);
    }
    public P(String s){
        name =s;
    }
}

class Q{
    public static void m1(P i){
        i=null;
    }
    public static void main(String args[]){
        P i = new P("X");           //1
        m1(i);                       //2
        System.out.println(i.name()); //3
    }
}
```

Find the correct statement relating to the above code:

- A) The Object created in line //1 is eligible for garbage collection in line //2
- B) A NullPointerException is generated in line //3.
- C) Prints X
- D) Compile Error.

14.

```
Class A{                               //1
    int x=1;                           //2
    public static void main(String args[]){ //3
        int y=2;                       //4
        System.out.print("x="+x);      //5
        System.out.print(", y="+y);    //6
    }
}
```

This code produces:

- A) x=1, y=2
- B) Compilation Error in line //5
- C) Compilation Error in line //6
- D) Runtime Error

15.

```
class B{
    static int m1(byte b){
        return b; //1
    }
    static int m2(char c){
        return c; //2
    }
    static int m3(short s){
        return s; //3
    }
    static int m4(long l){
        return l; //4
    }
    static int m5(float f){
        return f; //5
    }
    public static void main(String args[]){
        byte b=1;
        char c='c'-'a';
        short s=3;
        long l=4L;
        float f=5.0f;
        System.out.println(""+m1(b)+m2(c)+m3(s)+m4(l)+m5(f));
    }
}
```

The above code prints:

- A) 12345
- B) 12345.0
- C) compile error at //3 and //4
- D) compile error at //4 and //5

16.

```
class J{
    public static void main(String args[]){
        StringBuffer s1 = new StringBuffer(32);
        System.out.print(s1.length() + "," + s1.capacity());
    }
}
```

The above code:

- A) Prints: 0,0
- B) Prints: 0,32
- C) Prints: 32,0
- D) Prints: 32,32
- E) Compile Error

17.

```
class E{
    E(){
        System.out.print("E");
    }
    static class Z{
        Z(){
            System.out.print("Z");
        }
    }
    public static void main(String args[]){
        new E.Z();
        System.out.println("");
    }
}
```

The above code:

- A) prints : E
- B) prints : Z
- C) prints : EZ
- D) prints : ZE
- E) compile error

18.

```
class Q{
    static int m(int i){
        System.out.print(i+", ");
        return i;
    }
    public static void main(String args[]){
        int i = 1;
        m(++i);           //line A
        m(i++);           //line B
        m(-i);            //line C
        m(i++);           //line D
    }
}
```

The above code prints:

- A) 1,2,-3,4
- B) 2,2,-3,3
- C) 2,2,3,3
- D) 1,2,3,4

19.

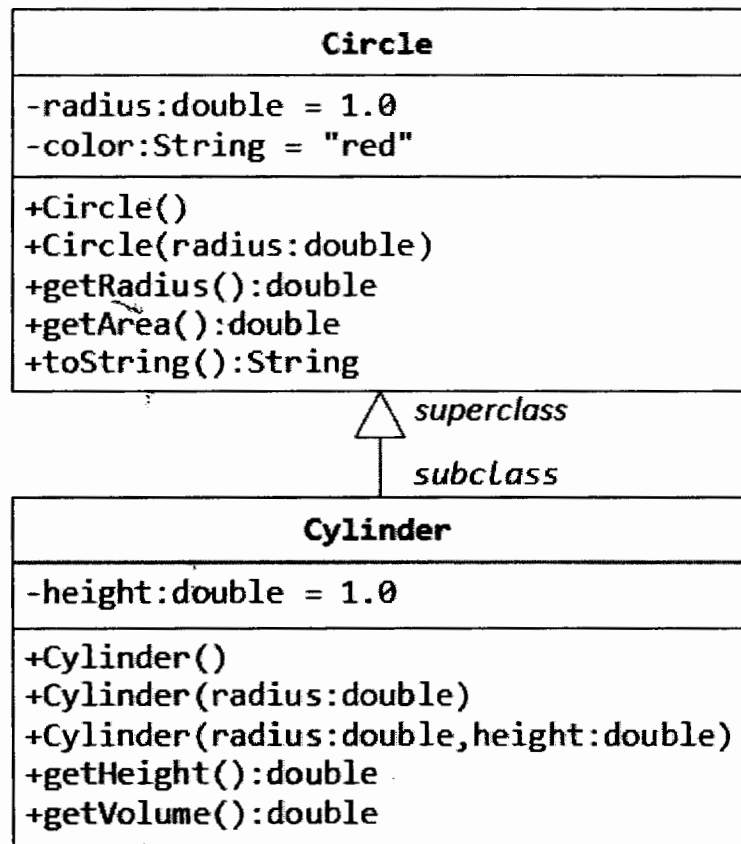
```
class A{
    void m1(A a) {System.out.print("A");}
}
class B extends A{
    void m1(B b) {System.out.print("B");}
}
class C extends B{
    void m1(C c) {System.out.print("C");}
}
class D{
    public static void main(String args[]){
        A c1 = new C();
        B c2 = new C();
        C c3 = new C();
        C c4 = new C();
        c4.m1(c1);
        c4.m1(c2);
        c4.m1(c3);
        System.out.println("");
    }
}
```

The above code:

- A) prints : AAA
- B) prints : BBB
- C) prints : CCC
- D) prints : ABC
- E) Compile error

20.

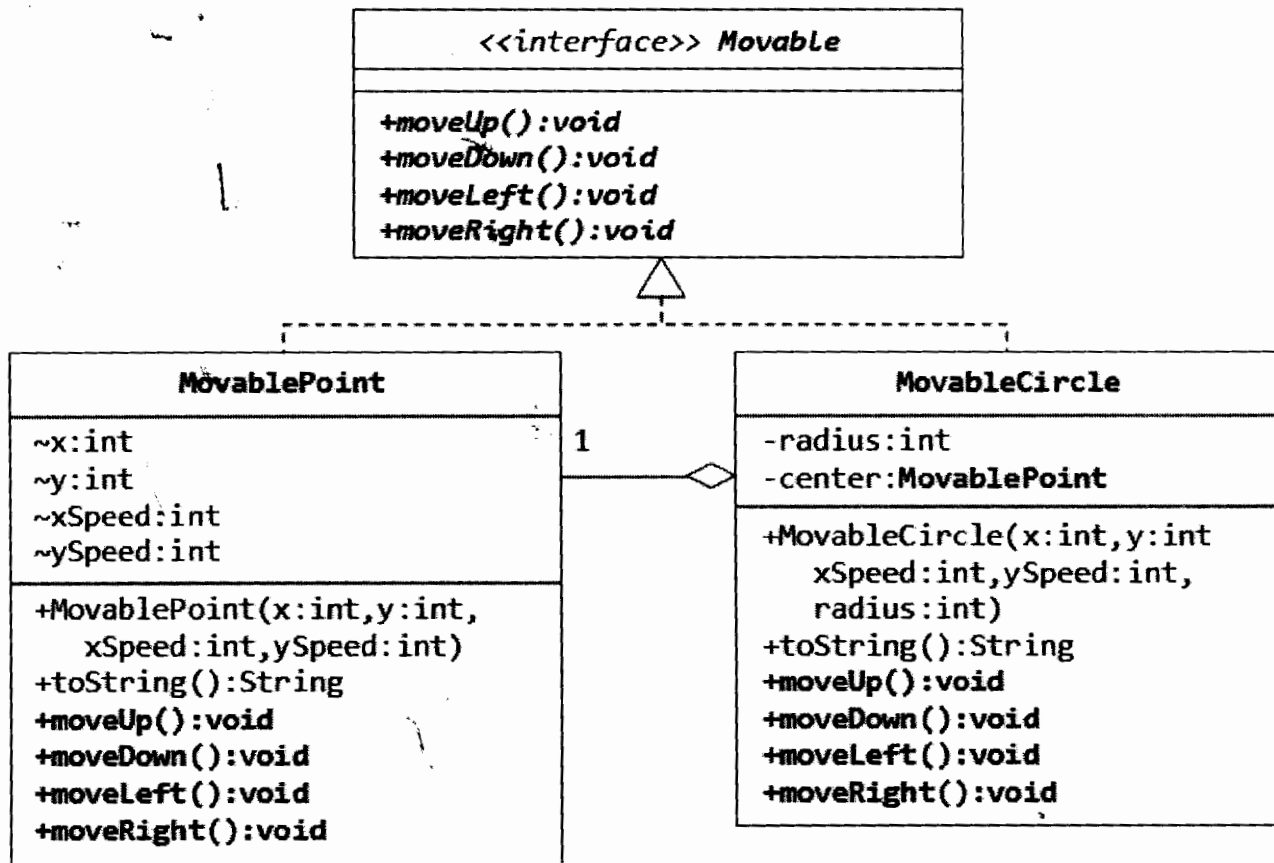
Write the **complete** java code for the following class Diagram. (space is provided, but you may use the rough sheet paper provided if you need) **(10 Marks)**



Answer for Question 20:

21.

Write the interface definition and the Class declarations for the following UML diagram. You do not need to write the internals of the methods. But you do need to correctly define the method body in the class the method needs to have a body. Write your answer in the space provided. Marks will be deducted if you write unneeded code. (14 Marks)



Answer for Question 21: